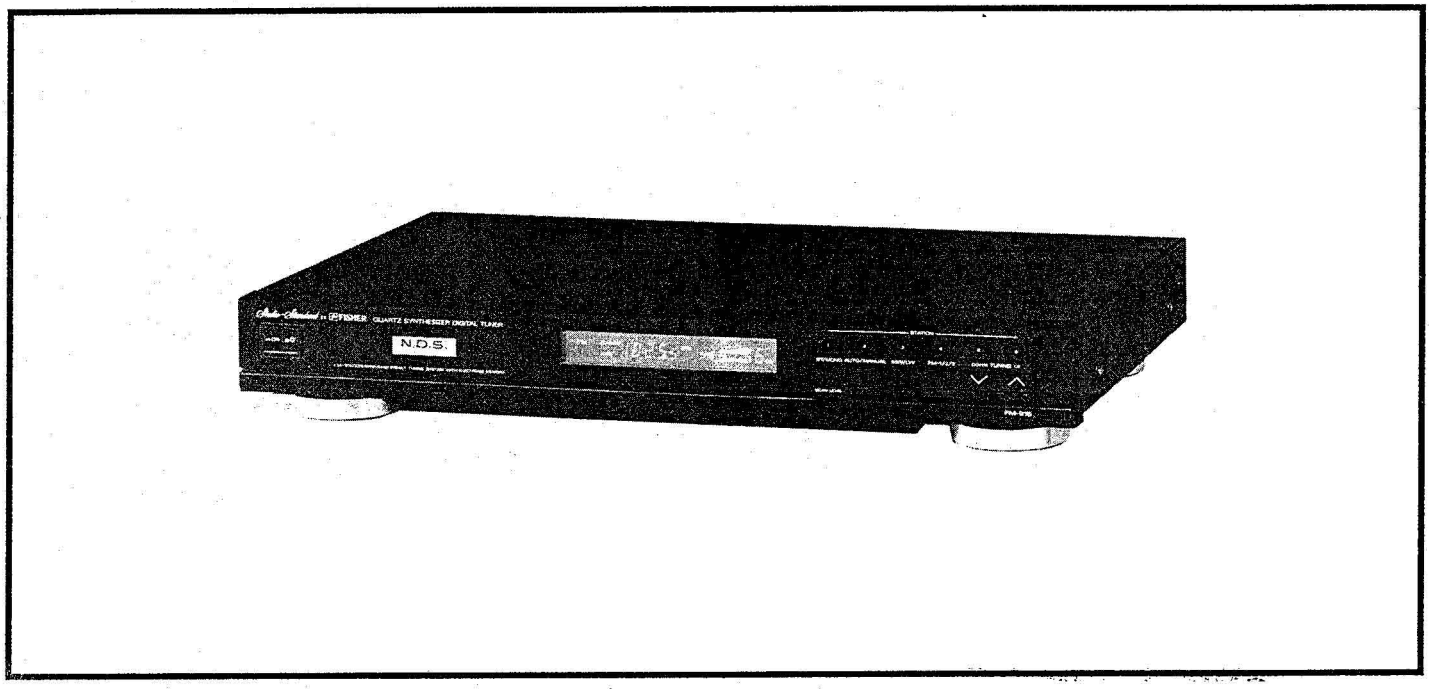
SERVICE MANUAL

FISHER

LW/MW/FM STEREO
SYNTHESIZER TUNER

FM-915

(EUROPE)



SPECIFICATIONS

FM SECTION

Usable Sensitivity
- Mono ..... 0.95 µV

46 dB Quieting Sensitivity
- Mono ..... 3.5 µV

Signal-to-Noise Ratio
- Mono ..... 70 dB
- Stereo ..... 63 dB

Capture Ratio ..... 1.5 dB
Alt. Channel Selectivity (±300 kHz) ..... 50 dB
Image Response Ratio ..... 70 dB
Spurious Response Ratio ..... 90 dB
IF Response Ratio ..... > 100 dB
AM Suppression Ratio ..... 60 dB
Total Harmonic Distortion at 60 dBf
- Mono (1 kHz) ..... 0.095 %
- Stereo (1 kHz) ..... 0.17 %

Stereo Separation
- (100 Hz/1 kHz/10 kHz) ..... 40/40/30 dB

Sub-Carrier Rejection (19 kHz/38 kHz) ..... 50/70 dB
Audio Frequency Response
- (20 Hz - 15 kHz) ..... ±0.1/−2.5 dB

MW SECTION

Usable Sensitivity ..... 550 µV/m
Selectivity (±9 kHz) ..... 35 dB
Signal-to-Noise Ratio ..... 55 dB
Image Response Ratio ..... 40 dB
IF Response Ratio ..... 70 dB

LW SECTION

Usable Sensitivity ..... 1800 µV/m
Selectivity (±9 kHz) ..... 35 dB
Signal-to-Noise Ratio ..... 53 dB
Image Response Ratio ..... 50 dB
IF Response Ratio ..... 70 dB

GENERAL

Power Requirements ..... AC 220V
- (50 Hz) 11W

Dimensions (W x H x D) ..... 440 x 63 x 256 mm
Weight (approx.) ..... 2.8 kg

– Specifications and design are subject to change without notice.

EFERENCE No. WM-570089

CAUTION ON RF ADJUSTMENT

This model uses a microprocessor for memory preset control for the various bands.
This function has been used to preset frequency points for the different bands to permit adjustment and make it possible to check the function of the microprocessor. To use this supplemental function, ground initialize Reset SW (SW514) by the Rear Panel for 1 second before beginning adjustment. The following table shows the initially preset frequencies.

Band	Memory					
	1	2	3	4	5	6
FM-1	87.5MHz	108MHz	88MHz	98MHz	100MHz	96MHz
MW/LW	603kHz	1404kHz	999kHz	160kHz	350kHz	250kHz

FM TUNER ALIGNMENT

FM ALIGNMENT – FUNCTION switch to FM ST/MUTE position.
Note: It is almost unnecessary to adjust coil in Front End as perfectly adjusted

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. FM IF S-CURVE ALIGNMENT	Connect 10.7MHz Radio IF Generator output to Pin IF (Front End) and ground lead to chassis. Use 5pF capacitor in series with generator output lead.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP6 and ground lead to chassis.	Adjust FM DET 1st Coil (L101) and FM DET 2nd Coil (L102) so that S-wave form becomes symmetrical.
2. DETECTOR ADJUSTMENT (MINIMUM T.H.D.)	Connect FM RF signal generator through FM Dummy Antenna to FM Antenna terminals. Set generator output level to 60dBμV at 98MHz ±2kHz.	Set Preset STATION button to "4" position. Set to 98MHz. Set ST/MONO switch to MONO.	Connect DC Voltmeter across TP3 and TP4.	Adjust FM DET 1st Coil (L101) until DC Voltmeter reads 0V ±50mV.
			Harmonic Distortion Analyzer to TUNER OUT.	Adjust FM DET 2nd Coil (L102) for minimum gain and best linearity.
Note: Repeat Step 1 (FM DET 1st Coil L101) and 2 (FM DET 2nd Coil L102) until optimum alignment is reached.				
3. FM MUTING LEVEL ADJUSTMENT	Same as above. Adjust attenuator output level for 18dBμV.	Same as above.	Front panel TUNED Display Indicator.	Set ST/MONO Switch to STEREO. Adjust VR502 until the TUNED Indicator partly light up.
Note: Decrease the output level of ATT and confirm that the wave form disappears. Increase the output level of ATT again and confirm that the input level meets the specifications sufficiently when the wave form has appeared.				
4. FM STEREO SIGNAL SEPARATION CONTROL	Connect FM Stereo SG to FM Antenna terminals. 19kHz signal ON. Main channel, sub channel signal ON. Apply 1000Hz signal from LEFT channel.		Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust VR301 for minimum output.
	Same as above for RIGHT channel.		Connect AC VTVM and Oscilloscope to TUNER OUT.	

Use a screwdriver with plastic grip for all adjustments.

MW/LW Frequency Cover Range
Tuning Voltage Value at TP9

(Table 1)

	153kHz	360kHz	522kHz	1611kHz
Minimum	1.0V	7.0V	0.8V	7.0V
Typical	1.2V	7.5V	1.0V	7.6V
Maximum	1.5V	9.0V	1.3V	9.0V

AM TUNER ALIGNMENT

AM ALIGNMENT – FUNCTION switch to MW or LW position.
Maintain generator output as low as possible for suitable indication.

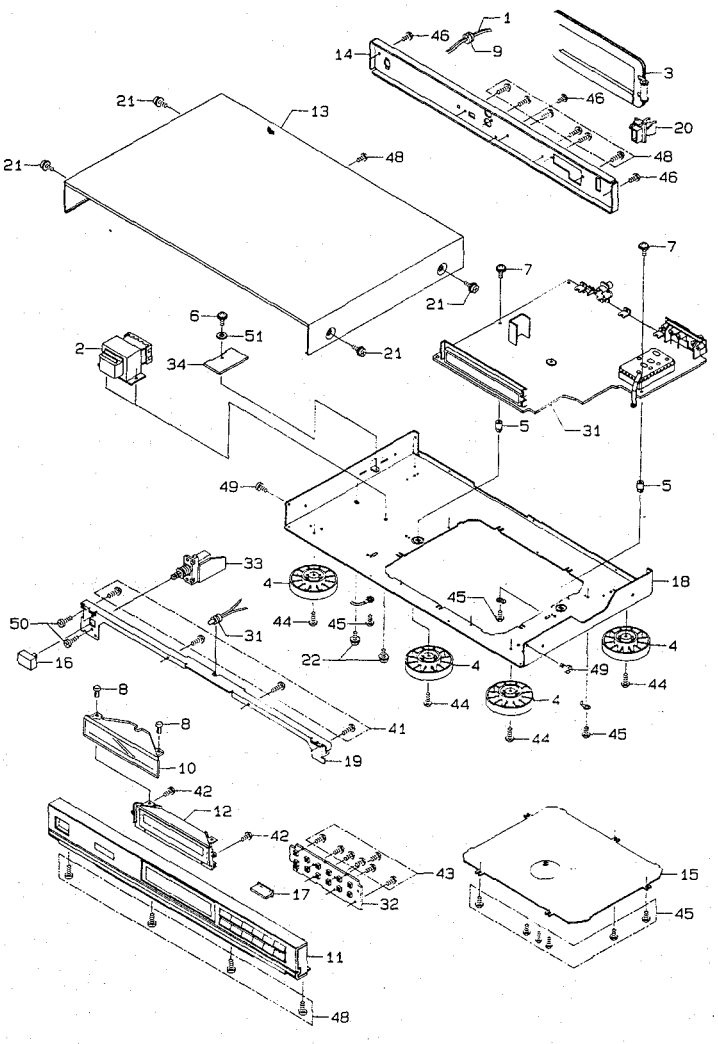
Note: Perform this alignment after FM Tuner Alignment.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. AM IF ALIGNMENT	Connect 450kHz Radio IF Genescope output to TP2 and ground Adjust output level to 70dBμV.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP5 and ground lead to chassis.	Adjust AM IFT (L205) for maximum gain and best symmetry. Keep signal low enough for noise on response.
2. MW RF FREQUENCY COVER ALIGNMENT (1611kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 1611kHz.	Connect DC Voltmeter to TP9 and ground lead to chassis.	Check DC Voltmeter for Indication 7.0V ~ 9.0V.
3. (522kHz)	Same as above.	DIGITAL Counter Display Set to 522kHz.	Same as above.	Check DC Voltmeter for Indication 0.8V ~ 1.3V.
Note: Repeat the adjustments in items 2 and 3. Then, confirm that each voltage becomes 1.0V to 7.6V at receiving frequency of 522kHz to 1611kHz. **(See Table 1)**				
4. LW RF FREQUENCY COVER ALIGNMENT (360kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 360kHz.	Connect DC Voltmeter to TP9 and ground lead to chassis.	Check DC Voltmeter for Indication 7.0V ~ 9.0V.
5. (153kHz)	Same as above.	DIGITAL Counter Display Set to 153kHz.	Same as above.	Check DC Voltmeter for Indication 1.0V ~ 1.5V.
Note: Repeat the adjustments in Items 4 and 5. Then, confirm that each voltage becames 1.2V to 7.5V at receiving frequency of 153kHz to 360kHz. **(See Table 1)**				
6. MW RF TRACKING ALIGNMENT (603kHz)	Connect Standard Loop Antenna to output terminal of AM RF Signal Generator. Place Loop Antenna 60cm away from Loop antenna (Unit). Generator Setting to 603kHz or 1404kHz. Modulate with 400Hz (30 % modulation).	Set Preset STATION button to "1" position. Set to 603kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust MW ANT Coil (L201) for maximum gain output.
7. (1404kHz)		Change Preset STATION button to "2" position. Set to 1404kHz.	Same as above.	Adjust MW ANT Trimmer (TC201) for maximum gain output.
Note: Repeat the adjustments in Items 6 and 7. Then, confirm there is no tracking error.				
8. LW RF TRACKING ALIGNMENT (160kHz)	Change generator setting to 160kHz.	Set Preset STATION button to "4" position. Set to 160kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust LW ANT Coil (L202) for maximum gain output.
9. (350kHz)	Change generator setting to 350kHz.	Change Preset STATION button to "5" position. Set to 350kHz.	Same as above.	Adjust LW ANT Trimmer (TC202) for maximum gain output.
Note: Repeat the adjustments in Items 8 and 9. Then, confirm there is no tracking error.				
10. AM AUTO STOP SENSITIVITY ADJUSTMENT	Change generator setting to 999kHz and output level to 60dBμV/m.	Set Preset STATION button to "3" position. Set to 999kHz.	Front Panel TUNED Indicator Display.	Adjust VR201 until the Indicator partly light up.

Use a screwdriver with plastic grip for all adjustments.

CABINET & CHASSIS PARTS LIST/EXPLODED VIEW

Ref. No.	Part No.	Description	Q'ty
PACKAGE			
	620 191 3583	Box Corrugate-Exp.	1
	620 059 3595	Pad Right	1
	620 059 3601	Pad Left	1
	620 059 6596	Patching Sheet	1
	620 148 5639	Poly Cover (Loop Antenna)	1
	620 148 8012	Sheet Polyethylene	1
	620 152 7452	Serial No. Sheet	2
ACCESSORIES			
	620 020 8093	Connector 3P Assy	1
	620 037 3463	RCA Cord 700mm Black	1
	620 038 1673	FM Antenna Assy	1
	620 057 8783	Bag Fan	1
	620 062 0543	Serial No. Sheet	1
	620 112 8123	Holder Antenna	1
	620 152 2624	Certificate Card	1
	620 191 6713	Explanatory Booklet	1
CABINET			
	620 050 2887	Cramp Wire	1
	620 062 0543	Serial No. Sheet	1
	620 125 8424	Wire Band	4
1	⚠ 620 023 7550	Power Cord	1
2	⚠ 620 191 2678	Power Trans	1
3	620 028 2734	AM Loop Antenna	1
4	620 185 2752	Leg Assy	4
5	620 050 4225	Mount P.C.B.	2
6	620 051 3692	Screw, Brazier Hd. Tapping-B, +M3.0X6	1
7	620 051 3715	Screw, Brazier Hd. Tapping-B, +M3.0X14	2
8	620 191 2746	Rivet 3.5	2
9	620 053 2136	Bushing	1
10	620 185 6972	Filter (Clear)	1
11	620 191 3675	Cabinet Front Assy	1
12	620 186 9514	Mount Screen Assy	1
13	620 088 2934	Cover	1
14	620 191 3835	Panel Rear	1
15	620 186 2607	Cover Bottom	1
16	620 191 9332	Knob (Power)	1
17	620 185 7177	Knob Touch	1
18	620 186 2690	Chassis	1
19	620 186 2713	Mount Cabinet Front	1
20	620 122 2210	Holder Antenna	1
21	620 123 0284	Screw, Bind Hd. Tapping-B, +M4.0X8	4
22	620 123 0833	Screw, Bind Hd. Tapping-B, +M4.0X10	2
31	620 191 3453	Tuner P.C.B. Assy	1
32	620 189 5674	Key Switch P.C.B. Assy	1
33	620 189 5681	Power Switch P.C.B. Assy	1
34	620 191 3460	EC T P.C.B. Assy	1
41	411 020 5201	SCR S-TPG BRZ 2.6X10	4
42	411 020 5508	SCR S-TPG BRZ 2.6X6	2
43	411 020 5706	SCR S-TPG BRZ 2.6X8	7
44	411 020 5904	SCR S-TPG BRZ 3X10	4
45	411 020 7700	SCR S-TPG BRZ 3X6	8
46	411 099 9704	SCR S-TPG BRZ 3X6	3
47	411 099 9803	SCR S-TPG BRZ 3X8	6
48	411 021 3206	SCR S-TPG BIN 2.6X8	4
49	411 021 5705	SCR S-TPG BIN 3X6	2
50	411 002 8503	SCR PAN 3X6	2
51	411 087 0102	WASHER In TW 3	1



NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty
TUNER P.C.B. ASSY			
31	620 191 3453	Tuner P.C.B. Assy	1
	620 191 8632	FM Frontend 4EU AGC	1

(Component parts used in Front End are not serviceable and available.)

	620 182 6616	Digitron 8-BT-75G	1
	620 017 2738	Fuse Clip	2
	620 188 9918	Pin Jack 2P Black	1
	620 022 2921	ANT Terminal 3P	1
	620 188 0885	Lamp	1
⚠	423 003 9809	FUSE 250V T630mA	1
	620 050 2450	Metal Mount Antenna	3
	620 052 4827	Cushion	1
	620 053 8848	Plate Heat Sink	1
	620 054 1954	Label	1
	620 118 2088	Plate Earth	1
	620 190 0521	Cover Shield	1
	620 186 2720	Bracket Digitron	1
W401	620 020 6914	Connector 1P Assy	1
CF101	620 014 5664	Ceramic Filter	1
CF103	620 014 5664	Ceramic Filter	1
CF201	620 026 6741	Mechanical Filter	1
CF301	620 014 6258	Ceramic OSC	1
CF501	620 026 9070	CSA 4.19M Resonator	1
CF502	620 007 1338	Crystal 7.2MHz	1
or	620 007 1314	Crystal 7.2MHz	1
F1	620 191 6607	FTZ Antenna Filter	1
or	620 026 9353	FTZ Antenna Filter	1
L101	620 189 6008	IFT DET 10.7M 1st K	1
L102	620 189 6015	IFT DET 10.7M 2nd K	1
L103	620 026 4396	Anti Birdie Filter	1
L201	620 028 1348	MW Antenna Coil	1
L202	620 028 1362	LW Antenna Coil	1
L203	620 190 3676	OSC Coil MW	1
or	620 185 9058	OSC Coil MW	1
or	620 028 7784	OSC Coil MW	1
L204	620 028 7845	OSC Coil LW	1
L205	620 027 7419	IFT AM 450K	1
L206	620 026 8103	Choke Coil 470μH	1
L301	620 026 7915	Choke Coil 100μH	1
L302	620 026 7915	Choke Coil 100μH	1
L303	620 026 4518	LP Filter	1
L304	620 026 4518	LP Filter	1
L505	620 026 7847	Choke Coil 102	1
PC505	620 021 6524	Plug 3P	1
RB501	620 004 5209	Resistor 10K-4 J	1
SW514	620 016 4467	Touch Switch 1P1T	1
TC201	620 007 0867	Trimmer 10PF	1
TC202	620 189 9108	Trimmer 20PF	1
VR102	620 006 1322	Semi Fixed (B-47kΩ)	1
VR201	620 006 1377	Potentiometer (B-10kΩ)	1
VR301	620 006 1384	Potentiometer (B-220kΩ)	1
VR502	620 006 1407	Potentiometer (B-2.2kΩ)	1
IC101	409 079 6904	IC LA1266A	1
IC301	409 017 0803	IC LA3400	1
IC501	410 060 9200	IC TMP47C 441AN-1669Z	1
IC502	409 025 7306	IC LM7000	1
Q102	405 016 0806	TR 2SC2839-E	1
Q103	405 021 0808	TR 2SD1012-H	1
Q107	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q201	405 039 5802	TR 2SC3792	1
Q202	405 027 0505	TR 2SK246-GR	1
Q204	405 004 4502	TR 2SA608-F-NP	1
Q205	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q206	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q207	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q208	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q209	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q301	405 021 0501	TR 2SD1012-G	1
or	405 021 0808	TR 2SD1012-H	1
Q302	405 021 0501	TR 2SD1012-G	1
or	405 021 0808	TR 2SD1012-H	1
Q303	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q401	405 035 7206	TR 2SD1913-S	1
or	405 035 7107	TR 2SD1913-R	1
Q402	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q403	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q404	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q405	405 023 5702	TR 2SD400-G-MP	1
or	405 023 5306	TR 2SD400-F-MP	1
Q502	405 017 9600	TR 2SC3330-T	1
or	405 017 9709	TR 2SC3330-U	1
Q503	405 017 9600	TR 2SC3330-T	1
or	405 017 9709	TR 2SC3330-U	1
Q509	405 004 5004	TR 2SA608-G-NP	1
or	405 004 4502	TR 2SA608-F-NP	1
Q510	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q511	405 019 3804	TR 2SC536-G-NP	1
or	405 019 2708	TR 2SC536-F-NP	1
Q512	405 018 2501	TR 2SC3399	1
Q601	405 027 8402	TR 2SK583	1
Q602	405 027 8402	TR 2SK583	1
D104	407 005 3805	DIODE DS442-BT	1

If necessary, replace both Diode D201, D202 (SVC321) together with new ones which have the equivalent characteristics.

D201	407 000 4708	VARACTOR DI SVC321C-2	1
or	407 000 4807	VARACTOR DI SVC321D-2	1
D202	407 000 4708	VARACTOR DI SVC321C-2	1
or	407 000 4807	VARACTOR DI SVC321D-2	1
D203	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D204	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D205	407 005 3805	DIODE DS442-BT	1
D301	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D302	407 005 3805	DIODE DS442-BT	1
D303	407 005 3805	DIODE DS442-BT	1
D401	407 005 2105	DIODE DS135D-KB3	1
D402	407 005 2105	DIODE DS135D-KB3	1
D403	407 005 2105	DIODE DS135D-KB3	1
D404	407 005 2105	DIODE DS135D-KB3	1
D405	407 005 2105	DIODE DS135D-KB3	1
D406	407 005 2105	DIODE DS135D-KB3	1
D407	407 005 2105	DIODE DS135D-KB3	1
D410	407 049 6305	ZENER DIODE GZA12Y-BT	1
or	407 049 6305	ZENER DIODE GZA12Y	1
D411	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D412	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D413	407 005 3805	DIODE DS442-BT	1
D414	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D415	407 005 3805	DIODE DS442-BT	1
D416	407 061 2200	DIODE 1SS254-TA	1
or	407 008 0405	DIODE GMB01-BT	1
or	407 077 0504	DIODE 1SS133-K	1
D418	407 050 6202	ZENER DIODE GZA6.2Y-BT	1
or	407 050 6103	ZENER DIODE GZA6.2X-BT	1
or	407 050 6202	ZENER DIODE GZA6.2Y	1
or	407 050 6103	ZENER DIODE GZA6.2X	1
D419	407 050 0002	ZENER DIODE GZA24X	1
D421	407 050 6202	ZENER DIODE GZA6.2Y	1
or	407 050 6103	ZENER DIODE GZA6.2X	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
D422	407 050 6202	ZENER DIODE GZA6.2Y				1
or	407 050 6301	ZENER DIODE GZA6.2Z				1
D501	407 005 3805	DIODE DS442-BT				1
D502	407 005 3805	DIODE DS442-BT				1
D503	407 005 3805	DIODE DS442-BT				1
D504	407 005 3805	DIODE DS442-BT				1
D514	407 061 2200	DIODE 1SS254-TA				1
or	407 008 0405	DIODE GMB01-BT				1
or	407 077 0504	DIODE 1SS133-K				1
D521	407 061 2200	DIODE 1SS254-TA				1
or	407 008 0405	DIODE GMB01-BT				1
or	407 077 0504	DIODE 1SS133-K				1
D524	407 061 2200	DIODE 1SS254-TA				1
or	407 008 0405	DIODE GMB01-BT				1
or	407 077 0504	DIODE 1SS133-K				1
D701	407 005 3805	DIODE DS442-BT				1
C36	403 022 7703	CERAMIC	33P	J	50V	1
C102	403 069 8404	CERAMIC	0.01U	Z	50V	1
C105	403 043 1100	ELECT	220U	M	16V	1
C107	403 069 8404	CERAMIC	0.01U	Z	50V	1
C108	403 062 0900	POLYESTER	0.047U	K	50V	1
C109	403 049 1708	ELECT	1U	M	50V	1
C113	403 074 2701	CERAMIC	0.047U	Z	50V	1
C114	403 074 2701	CERAMIC	0.047U	Z	50V	1
C116	403 001 1906	CERAMIC	0.01U	M	16V	1
C118	403 049 1708	ELECT	1U	M	50V	1
C121	403 043 1100	ELECT	220U	M	16V	1
C123	403 073 3204	CERAMIC	390P	K	50V	1
C124	403 044 0300	ELECT	47U	M	16V	1
C127	403 069 8404	CERAMIC	0.01U	Z	50V	1
C128	403 071 6207	CERAMIC	220P	K	50V	1
C133	403 075 4308	CERAMIC	820P	K	50V	1
C142	403 069 8404	CERAMIC	0.01U	Z	50V	1
C143	403 049 1708	ELECT	1U	M	50V	1
C201	403 026 2209	CERAMIC	47P	J	50V	1
C202	403 074 2701	CERAMIC	0.047U	Z	50V	1
C206	403 074 2701	CERAMIC	0.047U	Z	50V	1
C207	403 074 2701	CERAMIC	0.047U	Z	50V	1
C209	403 038 7209	ELECT	220U	M	6.3V	1
C211	403 069 8404	CERAMIC	0.01U	Z	50V	1
C212	403 049 5508	ELECT	10U	M	50V	1
C213	403 026 9406	CERAMIC	5P	C	50V	1
C214	403 024 1501	CERAMIC	39P	J	50V	1
C215	403 051 2106	ELECT	4.7U	M	50V	1
C216	403 051 2106	ELECT	4.7U	M	50V	1
C217	403 050 7805	ELECT	3.3U	M	50V	1
C218	403 057 0908	POLYESTER	0.01U	K	50V	1
C219	403 060 8700	POLYESTER	0.033U	K	50V	1
C221	403 075 0508	CERAMIC	6800P	K	50V	1
C222	403 088 4104	STYRENE	430P	J	50V	1
C223	403 014 2600	CERAMIC	18P	J	50V	1
C224	403 074 2701	CERAMIC	0.047U	Z	50V	1
C225	403 074 2701	CERAMIC	0.047U	Z	50V	1
C226	403 074 2701	CERAMIC	0.047U	Z	50V	1
C227	403 088 1103	STYRENE	330P	J	50V	1
C229	403 062 0900	POLYESTER	0.047U	K	50V	1
C230	403 030 6309	CERAMIC	68P	J	50V	1
C301	403 069 1207	CERAMIC	1000P	K	50V	1
C302	403 062 0900	POLYESTER	0.047U	K	50V	1
C304	403 044 0300	ELECT	47U	M	16V	1
C305	403 048 7701	ELECT	0.47U	M	50V	1
C306	403 049 1708	ELECT	1U	M	50V	1
C307	403 049 1708	ELECT	1U	M	50V	1
C308	403 069 8404	CERAMIC	0.01U	Z	50V	1
C310	403 049 5508	ELECT	10U	M	50V	1
C311	403 020 6203	CERAMIC	270P	K	50V	1
C312	403 020 6203	CERAMIC	270P	K	50V	1
C313	403 050 1308	ELECT	2.2U	M	50V	1
C314	403 050 1308	ELECT	2.2U	M	50V	1
C317	403 072 9603	CERAMIC	3300P	K	50V	1
C318	403 072 9603	CERAMIC	3300P	K	50V	1
C319	403 049 1708	ELECT	1U	M	50V	1
C320	403 049 1708	ELECT	1U	M	50V	1
C410	403 043 1100	ELECT	220U	M	16V	1
C411	403 044 0300	ELECT	47U	M	16V	1
C413	403 045 2907	ELECT	1000U	M	25V	1
C414	403 047 6309	ELECT	470U	M	25V	1
C416	403 097 6700	ELECT	330U	M	50V	1
C417	403 097 6700	ELECT	330U	M	50V	1

Ref. No.	Part No.	Description				Q'ty
C418	403 052 8107	ELECT	100U	M	35V	1
C421	403 038 7209	ELECT	220U	M	6.3V	1
C424	403 039 7901	ELECT	100U	M	10V	1
C425	403 038 7209	ELECT	220U	M	6.3V	1
C426	403 069 8404	CERAMIC	0.01U	Z	50V	1
C427	403 069 8404	CERAMIC	0.01U	Z	50V	1
C428	403 069 8404	CERAMIC	0.01U	Z	50V	1
C429	403 069 8404	CERAMIC	0.01U	Z	50V	1
C430	403 069 8404	CERAMIC	0.01U	Z	50V	1
C439	403 069 8404	CERAMIC	0.01U	Z	50V	1
C501	403 074 2701	CERAMIC	0.047U	Z	50V	1
C502	403 043 1100	ELECT	220U	M	16V	1
C503	404 039 4303	ELECT	2200U	M	10V	1
C507	403 038 2402	ELECT	100U	M	6.3V	1
C508	403 022 7703	CERAMIC	33P	J	50V	1
C509	403 022 7703	CERAMIC	33P	J	50V	1
C510	403 049 1708	ELECT	1U	M	50V	1
C511	403 001 1906	CERAMIC	0.01U	M	16V	1
C512	403 069 8404	CERAMIC	0.01U	Z	50V	1
C513	403 022 5907	CERAMIC	33P	J	50V	1
C514	403 022 5907	CERAMIC	33P	J	50V	1
C515	403 069 8404	CERAMIC	0.01U	Z	50V	1
C516	403 038 7209	ELECT	220U	M	6.3V	1
C517	403 068 9402	CERAMIC	100P	K	50V	1
C518	403 069 1207	CERAMIC	1000P	K	50V	1
C520	403 069 1207	CERAMIC	1000P	K	50V	1
C522	403 026 2209	CERAMIC	47P	J	50V	1
C601	403 056 8608	POLYESTER	1000P	K	50V	1
C602	403 056 8608	POLYESTER	1000P	K	50V	1
C603	403 001 5102	CERAMIC	2200P	M	16V	1
C604	403 069 1207	CERAMIC	1000P	K	50V	1
C605	403 050 1308	ELECT	2.2U	M	50V	1
C606	403 049 1708	ELECT	1U	M	50V	1
C607	403 043 1100	ELECT	220U	M	16V	1
C700	403 001 1906	CERAMIC	0.01U	M	16V	1
R101	401 024 7004	CARBON	1K	JA	1/6W	1
R103	401 026 9600	CARBON	470	JA	1/6W	1
R104	401 025 7805	CARBON	2.2K	JA	1/6W	1
R105	401 026 3905	CARBON	330	JA	1/6W	1
R107	401 018 2800	CARBON	330	JA	1/4W	1
R108	401 025 4200	CARBON	1.8K	JA	1/6W	1
R109	401 016 1102	CARBON	22	JA	1/4W	1
R111	401 027 0309	CARBON	47K	JA	1/6W	1
R112	401 024 7707	CARBON	100K	JA	1/6W	1
R113	401 012 8105	CARBON	100K	JA	1/4W	1
R114	401 027 0309	CARBON	47K	JA	1/6W	1
R121	401 024 7400	CARBON	10K	JA	1/6W	1
R122	401 026 2908	CARBON	3K	JA	1/6W	1
R124	401 016 1102	CARBON	22	JA	1/4W	1
R128	401 026 3905	CARBON	330	JA	1/6W	1
R129	401 017 2801	CARBON	27K	JA	1/4W	1
R130	401 027 5502	CARBON	6.8K	JA	1/6W	1
R131	401 027 0309	CARBON	47K	JA	1/6W	1
R132	401 024 7707	CARBON	100K	JA	1/6W	1
R135	401 026 1000	CARBON	2.7K	JA	1/6W	1
R161	401 018 3807	CARBON	3.3K	JA	1/4W	1
R200	401 018 3807	CARBON	3.3K	JA	1/4W	1
R201	401 024 7707	CARBON	100K	JA	1/6W	1
R203	401 021 3009	CARBON	5.6K	JA	1/4W	1
R204	401 024 7004	CARBON	1K	JA	1/6W	1
R205	401 027 0507	CARBON	470K	JA	1/6W	1
R206	401 026 9600	CARBON	470	JA	1/6W	1
R207	401 026 1000	CARBON	2.7K	JA	1/6W	1
R208	401 012 5708	CARBON	1K	JA	1/4W	1
R209	401 026 9907	CARBON	4.7K	JA	1/6W	1
R210	401 012 4503	CARBON	100	JA	1/4W	1
R211	401 012 5708	CARBON	1K	JA	1/4W	1
R212	401 012 5708	CARBON	1K	JA	1/4W	1
R213	401 022 3107	CARBON	6.8K	JA	1/4W	1
R214	401 014 4105	CARBON	1.5K	JA	1/4W	1
R217	401 025 4606	CARBON	18K	JA	1/6W	1
R218	401 018 3807	CARBON	3.3K	JA	1/4W	1
R219	401 027 0309	CARBON	47K	JA	1/6W	1
R220	401 012 8105	CARBON	100K	JA	1/4W	1
R224	401 026 7002	CARBON	3.9K	JA	1/6W	1
R225	401 024 7707	CARBON	100K	JA	1/6W	1
R226	401 027 2600	CARBON	5.6K	JA	1/6W	1
R227	401 027 2600	CARBON	5.6K	JA	1/6W	1
R229	401 024 7707	CARBON	100K	JA	1/6W	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description		Q'ty
R230	401 024 7707	CARBON	100K JA 1/6W	1
R231	401 016 2208	CARBON	220 JA 1/4W	1
R232	401 025 1902	CARBON	15K JA 1/6W	1
R233	401 025 8208	CARBON	22K JA 1/6W	1
R234	401 024 7707	CARBON	100K JA 1/6W	1
R235	401 024 7004	CARBON	1K JA 1/6W	1
R236	401 025 8208	CARBON	22K JA 1/6W	1
R237	401 025 8208	CARBON	22K JA 1/6W	1
R238	401 025 8208	CARBON	22K JA 1/6W	1
R239	401 027 0309	CARBON	47K JA 1/6W	1
R241	401 012 8105	CARBON	100K JA 1/4W	1
R243	401 026 9907	CARBON	4.7K JA 1/6W	1
R244	401 016 4806	CARBON	22K JA 1/4W	1
R245	401 024 7707	CARBON	100K JA 1/6W	1
R246	401 018 3807	CARBON	3.3K JA 1/4W	1
R301	401 016 1102	CARBON	22 JA 1/4W	1
R302	401 026 4308	CARBON	3.3K JA 1/6W	1
R303	401 024 7707	CARBON	100K JA 1/6W	1
R304	401 012 7009	CARBON	10K JA 1/4W	1
R305	401 024 7400	CARBON	10K JA 1/6W	1
R306	401 016 4806	CARBON	22K JA 1/4W	1
R307	401 024 7400	CARBON	10K JA 1/6W	1
R308	401 012 7009	CARBON	10K JA 1/4W	1
R311	401 025 4903	CARBON	180K JA 1/6W	1
R312	401 025 4903	CARBON	180K JA 1/6W	1
R313	401 025 4903	CARBON	180K JA 1/6W	1
R314	401 025 4903	CARBON	180K JA 1/6W	1
R315	401 016 3809	CARBON	2.2K JA 1/4W	1
R316	401 016 3809	CARBON	2.2K JA 1/4W	1
R317	401 027 2600	CARBON	5.6K JA 1/6W	1
R318	401 027 2600	CARBON	5.6K JA 1/6W	1
R319	401 024 7004	CARBON	1K JA 1/6W	1
R320	401 024 7004	CARBON	1K JA 1/6W	1
R321	401 018 3807	CARBON	3.3K JA 1/4W	1
R322	401 026 4308	CARBON	3.3K JA 1/6W	1
R323	401 024 7400	CARBON	10K JA 1/6W	1
R324	401 016 4806	CARBON	22K JA 1/4W	1
R329	401 025 1902	CARBON	15K JA 1/6W	1
R401	402 015 3807	FUSIBLE RES	2.7 J- 1/4W	1
R402	401 022 0403	CARBON	68 JA 1/4W	1
R403	401 012 7009	CARBON	10K JA 1/4W	1
R404	401 026 9600	CARBON	470 JA 1/6W	1
R405	401 018 3807	CARBON	3.3K JA 1/4W	1
R406	401 024 7707	CARBON	100K JA 1/6W	1
R407	401 025 8208	CARBON	22K JA 1/6W	1
R408	401 016 1102	CARBON	22 JA 1/4W	1
R411	401 016 3403	CARBON	2.2K JA 1/4W	1
R412	402 015 4606	FUSIBLE RES	4.7 J- 1/4W	1
R413	401 024 6700	CARBON	100 JA 1/6W	1
R414	401 024 6700	CARBON	100 JA 1/6W	1
R416	402 040 1700	OXIDE-MT	470 JB 2W	1
R418	401 143 5707	OXIDE-MT	5.6K JB 2W	1
R501	401 012 5708	CARBON	1K JA 1/4W	1
R502	401 026 3905	CARBON	330 JA 1/6W	1
R503	401 027 2303	CARBON	560 JA 1/6W	1
R504	401 024 7400	CARBON	10K JA 1/6W	1
R505	401 020 0801	CARBON	470 JA 1/4W	1
R506	401 012 7009	CARBON	10K JA 1/4W	1
R508	401 012 7009	CARBON	10K JA 1/4W	1
R509	401 012 7009	CARBON	10K JA 1/4W	1
R510	401 012 8105	CARBON	100K JA 1/4W	1
R519	401 027 2600	CARBON	5.6K JA 1/6W	1
R520	401 027 2600	CARBON	5.6K JA 1/6W	1
R529	401 012 7009	CARBON	10K JA 1/4W	1
R530	401 012 8105	CARBON	100K JA 1/4W	1
R532	401 024 7004	CARBON	1K JA 1/6W	1
R533	401 024 7004	CARBON	1K JA 1/6W	1
R539	401 012 8105	CARBON	100K JA 1/4W	1
R540	401 012 7009	CARBON	10K JA 1/4W	1
R541	401 026 4605	CARBON	33K JA 1/6W	1
R542	401 026 4605	CARBON	33K JA 1/6W	1
R543	401 026 4605	CARBON	33K JA 1/6W	1
R544	401 026 4605	CARBON	33K JA 1/6W	1
R545	401 026 4605	CARBON	33K JA 1/6W	1
R546	401 026 4605	CARBON	33K JA 1/6W	1
R547	401 026 4605	CARBON	33K JA 1/6W	1
R548	401 026 4605	CARBON	33K JA 1/6W	1
R549	401 012 7009	CARBON	10K JA 1/4W	1
R550	401 012 5708	CARBON	1K JA 1/4W	1

Ref. No.	Part No.	Description		Q'ty
R551	401 026 4605	CARBON	33K JA 1/6W	1
R552	401 026 4605	CARBON	33K JA 1/6W	1
R553	401 026 4605	CARBON	33K JA 1/6W	1
R554	401 026 4605	CARBON	33K JA 1/6W	1
R555	401 018 4903	CARBON	33K JA 1/4W	1
R556	401 018 4903	CARBON	33K JA 1/4W	1
R557	401 018 4903	CARBON	33K JA 1/4W	1
R558	401 018 4903	CARBON	33K JA 1/4W	1
R559	401 024 7004	CARBON	1K JA 1/6W	1
R563	401 024 7707	CARBON	100K JA 1/6W	1
R567	401 026 4308	CARBON	3.3K JA 1/6W	1
R568	401 026 4308	CARBON	3.3K JA 1/6W	1
R569	401 026 4308	CARBON	3.3K JA 1/6W	1
R570	401 026 4308	CARBON	3.3K JA 1/6W	1
R571	401 018 3807	CARBON	3.3K JA 1/4W	1
R572	401 018 3807	CARBON	3.3K JA 1/4W	1
R573	401 018 3807	CARBON	3.3K JA 1/4W	1
R574	401 026 4308	CARBON	3.3K JA 1/6W	1
R576	401 012 7009	CARBON	10K JA 1/4W	1
R577	401 012 7009	CARBON	10K JA 1/4W	1
R578	401 012 7009	CARBON	10K JA 1/4W	1
R579	401 012 7009	CARBON	10K JA 1/4W	1
R580	401 012 5708	CARBON	1K JA 1/4W	1
R582	401 012 7009	CARBON	10K JA 1/4W	1
R583	401 024 7400	CARBON	10K JA 1/6W	1
R584	401 024 7400	CARBON	10K JA 1/6W	1
R586	401 026 9303	CARBON	47 JA 1/6W	1
R587	401 024 7004	CARBON	1K JA 1/6W	1
R588	401 024 7004	CARBON	1K JA 1/6W	1
R589	401 024 7004	CARBON	1K JA 1/6W	1
R594	401 027 2600	CARBON	5.6K JA 1/6W	1
R600	401 012 4503	CARBON	100 JA 1/4W	1
R601	401 012 5708	CARBON	1K JA 1/4W	1
R602	401 012 5708	CARBON	1K JA 1/4W	1
R603	401 024 7004	CARBON	1K JA 1/6W	1
R604	401 024 7004	CARBON	1K JA 1/6W	1
R605	401 025 7805	CARBON	2.2K JA 1/6W	1
R606	401 026 7002	CARBON	3.9K JA 1/6W	1
R607	401 018 3807	CARBON	3.3K JA 1/4W	1
R608	401 020 2003	CARBON	4.7K JA 1/4W	1
R609	401 020 0801	CARBON	470 JA 1/4W	1
R697	401 027 0309	CARBON	47K JA 1/6W	1
R698	401 027 0309	CARBON	47K JA 1/6W	1
R719	401 025 8208	CARBON	22K JA 1/6W	1
R801	401 017 0807	CARBON	270 JA 1/4W	1

KEY SWITCH P.C.B. ASSY

32	620 189 5674	Key Switch P.C.B. Assy	1
SW501	620 015 1917	Keyboard Switch 6 mm	1
SW502	620 015 1917	Keyboard Switch 6 mm	1
SW503	620 015 1917	Keyboard Switch 6 mm	1
SW504	620 015 1917	Keyboard Switch 6 mm	1
SW505	620 015 1917	Keyboard Switch 6 mm	1
SW506	620 015 1917	Keyboard Switch 6 mm	1
SW507	620 015 1917	Keyboard Switch 6 mm	1
SW508	620 015 1917	Keyboard Switch 6 mm	1
SW509	620 015 1917	Keyboard Switch 6 mm	1
SW510	620 015 1917	Keyboard Switch 6 mm	1
SW511	620 015 1917	Keyboard Switch 6 mm	1
SW512	620 015 1917	Keyboard Switch 6 mm	1
SW513	620 193 0238	Tact Switch K	1
or	620 189 5940	Tact Switch	1

POWER SWITCH P.C.B. ASSY

33	620 189 5681	Power Switch P.C.B. Assy	1
SW401⚠	620 016 5815	Switch Push 1 Key	1
C442 ⚠	403 074 2701	CERAMIC 0.047U Z 50V	1
C443 ⚠	403 074 2701	CERAMIC 0.047U Z 50V	1

EC T P.C.B. ASSY

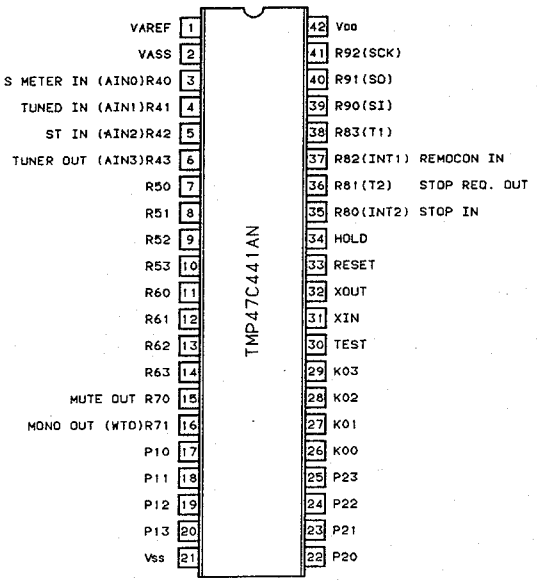
34	620 191 3460	EC T P.C.B. Assy	1
	620 022 2587	EC Terminal 1P	2
	620 031 4763	Wire Wrap Terminal	3

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

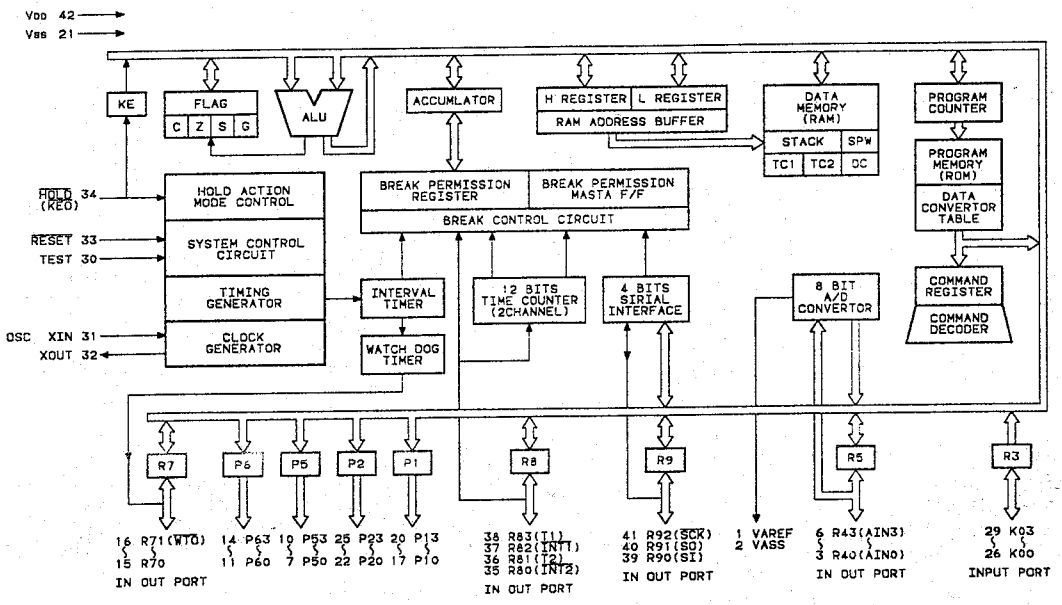
CPU PORT DESIGNATIONS (TMP47C441AN)

TMP47C441AN OUTLINE

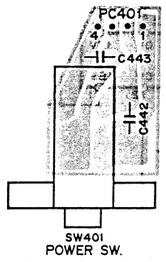


Port	Pin No.	Explanation of Function	Port	Pin No.	Explanation of Function
VAREF	1	VAREF	P20	22	S4
VASS	2	VASS	P21	23	S3
R40 (AIN0)	3	S Meter IN	P22	24	S2
R41 (AIN1)	4	TUNED IN	P23	25	S1
R42 (AIN2)	5	ST IN	K00	26	K0 IN
R43 (AIN3)	6	TUNER OUT	K01	27	K1 IN
R50	7	8G	K02	28	K2 IN
R51	8	7G	K03	29	K3 IN
R52	9	6G	TEST	30	TEST IN
R53	10	5G	N IN	31	X IN
R60	11	4G	X OUT	32	X OUT
R61	12	3G	RESET	33	RESET IN
R62	13	2G	HOLD	34	HOLD IN
R63	14	1G	R80 (INT2)	35	STOP IN
R70	15	MUTE OUT	R81 (T2)	36	STOP REQ. OUT
R71 (WTO)	16	MONO OUT	R82 (INT1)	37	REMOCON IN
P10	17	S5	R83 (T1)	38	CE2
P11	18	S6	R90 (S1)	39	CE1
P12	19	S7	R91 (S0)	40	DATA
P13	20	S8	R92 (SCK)	41	CLK
VSS	21	VSS	VDD	42	VDD

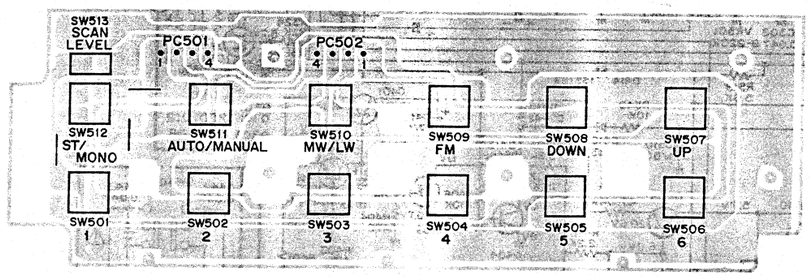
TMP47C441AN BLOCK DIAGRAM



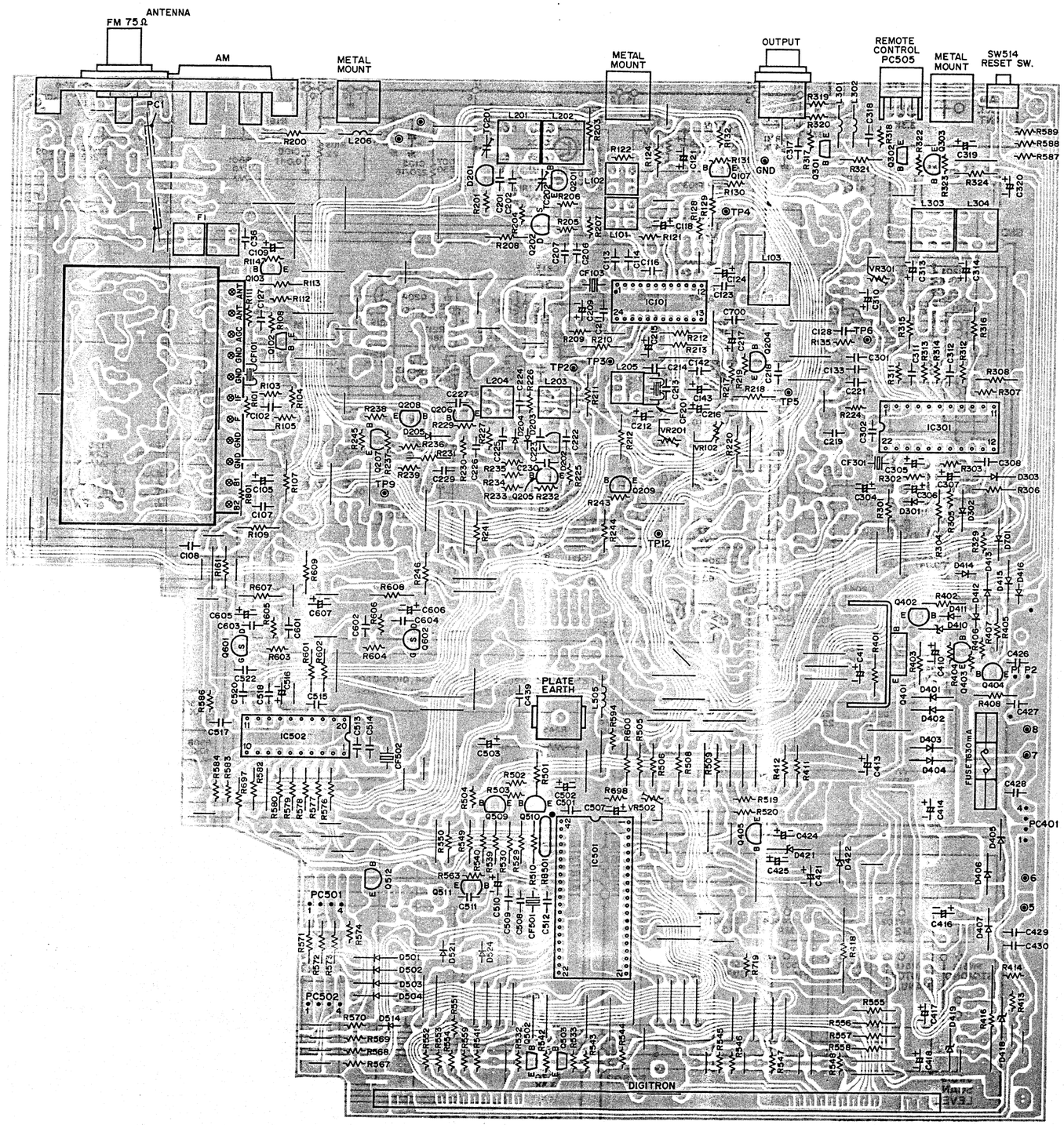
POWER SW. P.C.BOARD
(BOTTOM VIEW)



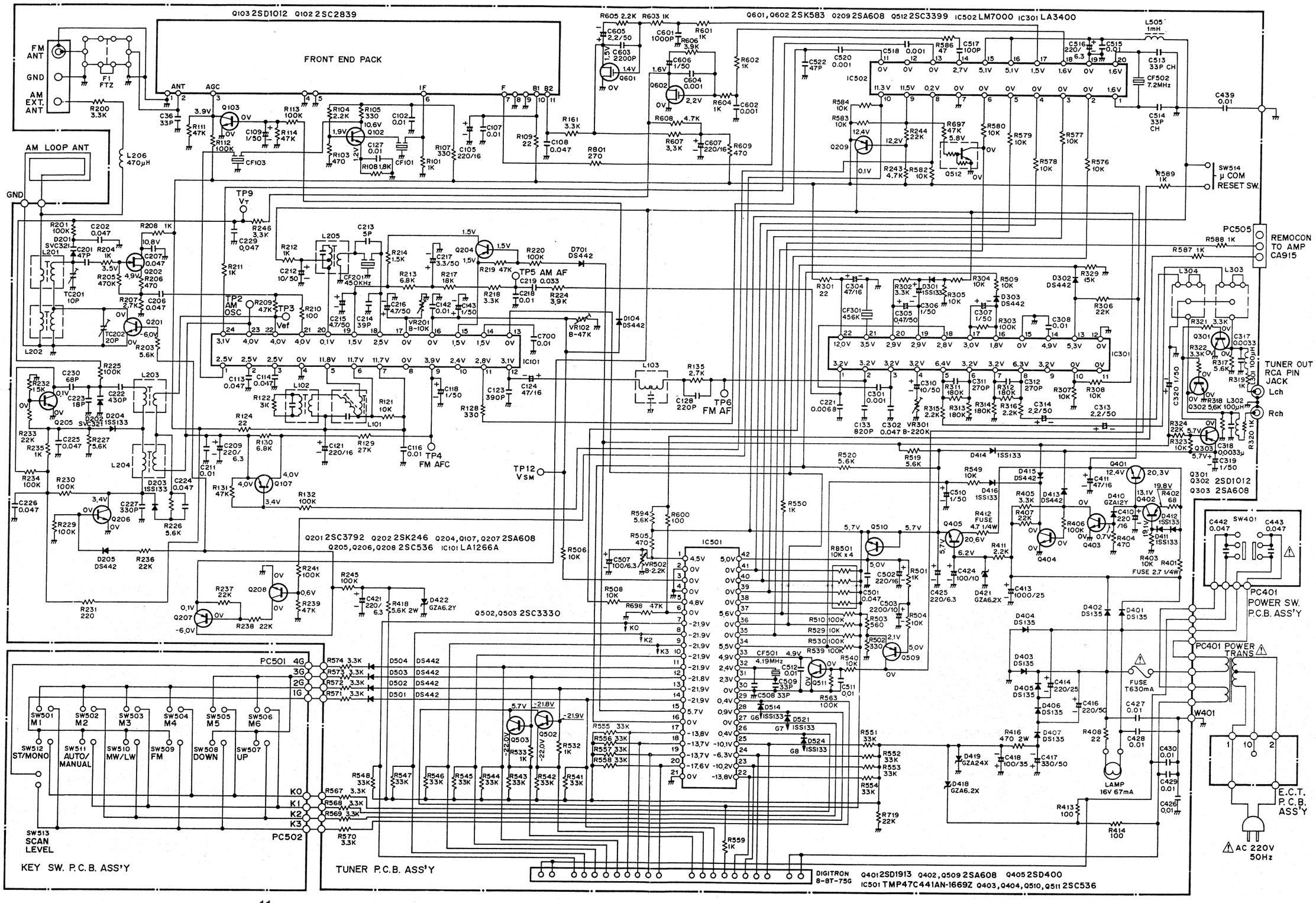
KEY SWITCH P.C.BOARD
(BOTTOM VIEW)



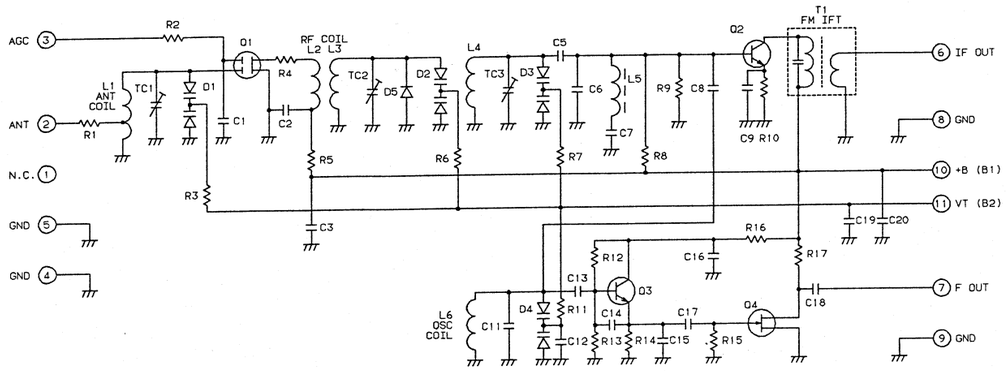
TUNER PRINTED CIRCUIT BOARD
(BOTTOM VIEW)



SCHEMATIC DIAGRAM



FRONT END SCHEMATIC DIAGRAM



IMPORTANT NOTE

The tuner has been Factory-adjusted for operation on 220V AC. The voltage can be changed for operation on 110V AC by making the following changes on the tuner inside.

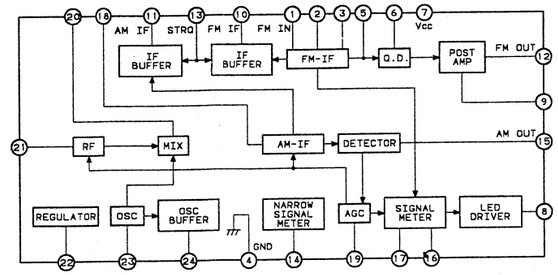
1. Remove the AC plug from the wall outlet.
2. Remove the screws securing the cover.
3. Disconnect Gray lead from E.C.T. P.C.Board Terminal No. 10, and then connect it to E.C.T. P.C.Board Terminal No. 2.
4. Disconnect Orange lead from E.C.T. P.C.Board Terminal No. 2, and then connect it to E.C.T. P.C.Board Terminal No.10.

The tuner is now ready 110V operation. DO NOT attempt to operate the tuner on 220V.
Damage will result !

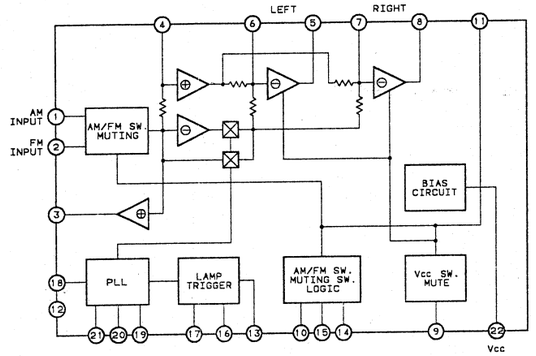
NOTES:
1. All resistors values are indicated in "ohm" (K = 10^3, M = 10^6).
2. All capacitors values are indicated in "μF" (P = 10^{-12}).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10 % with respect to chassis ground.
   c. No signals at input terminals.
   d. AC input at 220 volts 50 Hz.
4. This is a basic schematic diagram.

IC BLOCK DIAGRAM

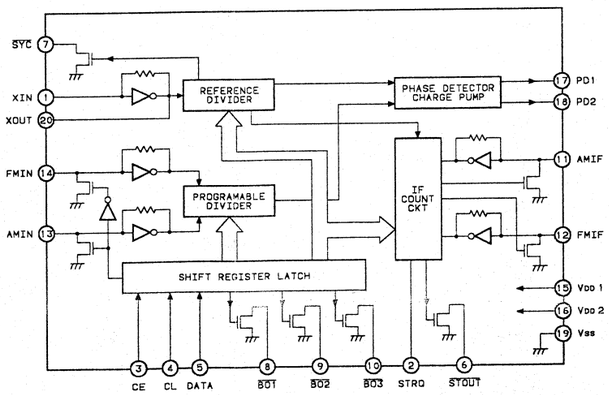
LA1266A BLOCK DIAGRAM



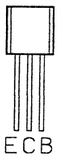
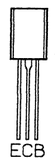
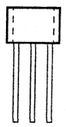
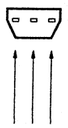
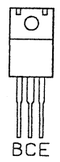
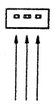
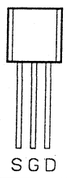
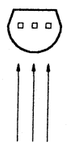
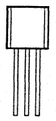
LA3400 BLOCK DIAGRAM



LM7000 BLOCK DIAGRAM



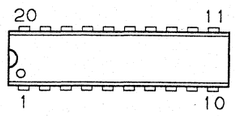
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW	TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA608 2SC3792 2SC536			2SD400		
2SC2839 2SC3399 2SD1012			2SD1913		
2SC3330			2SK246		
2SK583					

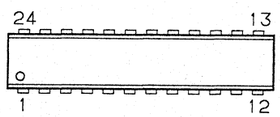
TERMINAL NAME

B → BASE
C → COLLECTOR
E → EMITTER
S → SOURCE
G → GATE
D → DRAIN

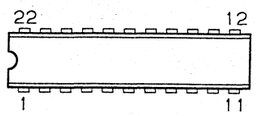
LM7000 TOP VIEW



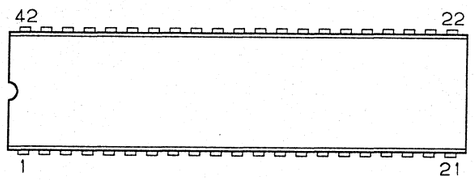
LA1266A TOP VIEW



LA3400 TOP VIEW



TMP47C441AN TOP VIEW



FISHER

FISHER Hi-Fi Europa Vertriebs GmbH

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8000 München 82 Tlx: 524033

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Qualitätskontrolle

Funkstörmeßlabor -127/128

Service-Zentrale
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Hi-Fi/Audio -168
Video -172
Autoradio -170
Ersatzteillager -155/156
Techn. Schulung -174

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Senden Sie uns im Garantiefall die ausgefüllte Garantiekarte ein. Bei unverkauften Lagergeräten des Fachhandels gilt als Garantienachweis eine eidesstattliche Versicherung mit eingetragener Modellbezeichnung und Geräte-Nummer oder ein Liefernachweis. Die gleiche Regelung besteht auch für Reparaturaufträge.
Bitte geben Sie unbedingt die Ersatzteil-Nummer und die Modellbezeichnung an.
Sie sparen so wertvolle Zeit. Vielen Dank.

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